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OPNAV INSTRUCTION 5100.19D VOLUME III CHANGE TRANSMITTAL 1

From: Chief of Naval Operations

Subj: NAVY OCCUPATIONAL SAFETY AND HEALTH (NAVOSH) PROGRAM MANUAL FOR FORCES AFLOAT, VOLUME III

Encl: (1) Revised chapter D-15
(2) Revised pages D4-1, D4-3, D12-3, D15-A-1, D15-A-2, D15-E-1, G-1 through G-4, G-6, G-10 through G-14 and G-17

1. Purpose. To update and clarify occupational safety and health guidance for afloat forces.

2. Summary of changes. Changes to this volume update hazardous material program guidance for submarines and provide specific guidance on use of the Submarine Hazardous Material Inventory Management System (SHIMS)and the Submarine Material Control List (SMCL). All paragraphs with changes are annotated to indicate revisions.

3. Availability. This change transmittal will be incorporated into the unclassified compact disk produced and distributed by Defense Automated Printing (DAPS) Philadelphia. It may also be downloaded at http://neds.nebt.dap.mil and http://www.navosh.net.

4. Action. Remove chapter D-15 and pages D4-1, D4-3, D12-3, D15-A-1, D15-A-2, D15-E-1, G-1 through G-4, G-6, G-10 through G-14 and G-17 and replace with enclosure 1 of this change transmittal.

L.C. BAUCOM
By direction

Distribution:
(Same as basic)

CHAPTER D15

SUBMARINE HAZARDOUS MATERIAL CONTROL AND MANAGEMENT STANDARDS

D1501. DISCUSSION

a. Submarine Hazardous Material Control and Management (HMC&M) standards address the storage, use, and disposal of all hazardous material (HM). In addition, these standards also provide more stringent control and management guidance for HM since they may be atmosphere contaminants. The breathing of fumes, vapors, or gases from these materials may severely impact the health and safety of submariners and submarine equipment.

b. This chapter provides the detailed guidance that submariners need to properly manage and control HM. It supplements the information contained in chapter B3, specifically addressing submarine HMC&M processes.

c. Special precautions are required for the stowage, handling, and use of HM aboard submarines. Significant hazards include fire, poisoning by breathing toxic substances in unventilated spaces, dermatitis, asphyxiation, and burns of the skin and eyes. Some materials normally thought to be safe may become hazardous under certain use or storage conditions. This chapter contains general stowage and use standards for all HM, precautions for subcategories of HM (flammable materials, toxic materials, corrosive materials, oxidizers, aerosol containers, and compressed gases) and specific precautions for certain selected materials. Paragraph B0303 provides information on HM spill response and training. (R

d. The Submarine Hazardous Material Inventory and Management System (SHIMS) is a menu driven HM inventory and management tool for use aboard submarines. SHIMS provides a standardized tool to assist in submarine HM inventory management, shelf-life management, and implementation of submarine atmospheric control requirements including maintaining a Submarine Material Control Log and generating atmosphere contaminant tags. SHIMS includes the Submarine Material Control List (SMCL) allowing the Sailor to determine the usage category of HM items prior to procurement. SHIMS also provides a single source for submarine MSDS information and policy/guidance references. (A

D1502. GENERAL HMC&M STANDARDS

a. **HM Allowed Aboard Submarines.** Only HM listed in the SMCL is allowed aboard submarines. The SMCL is the authorized use list (AUL) for submarines. Personnel shall consult the SMCL to verify that HM is allowed aboard or to identify any limitations or restrictions associated with the use of HM. HM not listed in the SMCL is considered **prohibited** and shall not be brought aboard the submarine. If a requirement exists for a HM item and the material is not listed in the SMCL, the submarine shall complete a SMCL Feedback Report (SFR) and submit it to NSWCCD Code 632 with a copy to NAVSEA 05L23, and the Type Commander. NSWCCD shall coordinate with Naval Sea Systems Command (NAVSEASYSCOM) and the Submarine Material Review Board (SMRB) to respond to the SFR. The SFR (NAVSUP 4400/1) is found in Appendix D15-A or SHIMS. Each SMCL item is marked with a HM use category. NAVSEASYSCOM assigns these use categories based on the SMRB's safety and health assessment of the product. These use categories are: (R (R

(1) **Permitted (N)**. No restriction on use of this HM on submarines.

(2) **Prohibited (X)**. HM not allowed aboard submarines at **any time**.

(3) **Restricted (R)**. HM not allowed aboard submarines while underway, except under specific exemptions authorized by the submarine’s Executive Offi-

cer. Restricted material may be used onboard in limited quantities ***while in port and ventilating outboard***.

R) (4) **Limited (L)**. HM that may be used underway for a specific purpose under specified conditions and for which no non-toxic substitute exists. This HM shall not be carried aboard submarines in excess of required quantities.

b. **HM Requisition**. Personnel requiring HM shall obtain this material only through the submarine's supply department. Supply department personnel
R) shall ensure that requisitioned material is authorized onboard in accordance with the SMCL prior to submitting requisition forms. If the requisitioned HM is assigned a restricted usage category, written permission from the Executive Officer will be required to carry or use the material onboard during an underway period.

NOTE:

R) SERVMART purchases of HM shall be reviewed against the SMCL to ensure that the material is authorized onboard. All HM purchased through a SERVMART shall be provided to the supply department for recording in the Submarine Material Control Log prior to storage.

R) c. **HM Open Purchase**. To the maximum extent feasible, submarines shall procure and use standard stock HM.

(1) In the exceptional case for which the stock-numbered product can be clearly demonstrated to be inferior, or due to the urgency of need cannot be satisfied from supply system stock, Commanding Officers may justify and
R) authorize open market purchases of HM for those items. The submarine shall obtain an MSDS from the manufacturer or supplier and include with a SFR submitted to NSWCCD Code 632 with copies to NAVSEA 05L23, and the Type Commander.

(2) If a commercial vendor approaches submarines or support com-
R) mands offering HM not listed in the SMCL for submarine use or for substitution for stock-numbered HM, the vendors shall be referred to NAVSEA 05L23.

d. **HM Receipt**. The supply department will receive all HM brought aboard the submarine. The supply department shall check all containers of HM obtained through open purchase upon receipt to ensure that they contain a manufacturer's label as described in paragraph D1502e. They shall refuse a con-
R) tainer if not so marked. Upon receipt, the supply department shall re-verify the received material against the SMCL by stock number, manufacturer, and nomenclature to ensure that the material is allowed onboard and determine if any HM use category other than allowed is assigned.

(1) If the material is permitted (N), entry in the Submarine Material Control Log is not required.

(2) If the material is assigned a limited (L) use category, the receiving person shall enter the material into the Submarine Material Control Log (Appendix D15-B or SHIMS) and make out an Atmosphere Contaminant Tag
R) (Appendix D15-C or SHIMS). The Supply Officer/HM coordinator shall sign the Atmosphere Contaminant Tag and review the Submarine Material Control Log entry.

(3) If the material is assigned a restricted (R) use category, the receiving person shall enter the material into the Submarine Material Control Log and make out an Atmosphere Contaminant Tag (Appendix D15-B, D15-C, or
R) SHIMS). The Supply Officer/HM coordinator shall sign the Atmosphere Contaminant Tag. If restricted (R) material is required to be used or stored onboard while underway, the Executive Officer shall provide written permission.

(4) If the material is assigned a prohibited (X) use category, do not bring the item aboard.

e. **Container Marking**

(1) Manufacturer's labels for shipboard identification of HM containers must clearly identify the material name, the manufacturer's name and address, and the nature of the hazard presented by the HM including the target organ potentially affected by the material. A manufacturer's label may be a tag, sign, placard, or gummed sticker. When HM is dispensed from the shipping container to another container, the person dispensing the HM shall annotate the receiving container to indicate the material name, manufacturer name and address, and the nature of the hazard (including target organ) as specified by the manufacturer to preserve the continuity of information. To mark unlabeled containers or containers where the label has been destroyed or damaged, ships may use the Department of Defense (DOD) Hazardous Chemical Warning Label. The Hazardous Material Information System (HMIS) (reference D15-2) provides this label and label information at the end of each MSDS. Personnel can print the label on plain paper or the pre-printed color forms: DD 2521 (12/88) (8.5"x11") (S/N 0102-LF-012-0800) or DD 2522 (12/88) (4"x7") (S/N 0102-LF-012-1100). (R

NOTE:

If the material is transferred into a small container, such as a dropper bottle for boiler water chemistry, and there is insufficient room on the container to affix the label, an abbreviated label shall be affixed containing the material name, manufacturer's name, and stock number at a minimum. The remaining information shall be provided on a card in a location known to the users, that is in close proximity to the container, so that it can be readily referred to. In addition, supplemental label information may be coded, using numbers or letters, to the smaller containers. (R

(2) Submarine supply departments shall label HM items that are restricted or limited with an Atmosphere Contaminant Tag (Appendix D15-C or SHIMS) per paragraph D1502(d) prior to issue. If a restricted or limited HM is transferred to another container for use, the new container shall also be labeled with the Atmosphere Contaminant Tag. The department transferring the material to the new container shall obtain the tag from the supply department. (R

f. **HM Issue.** The supply department retains only limited quantities of HM as storeroom items. The remainder is distributed to responsible workcenters as operating space items. The receiving workcenter is responsible for proper stowage of HM in assigned lockers.

g. **HM Reutilization.** Submarines shall practice HM reutilization. This means that submarines will implement efforts to ensure that personnel make all beneficial uses of HM prior to offload as used/excess HM. This requires that material with the earliest expiring shelf-life limitations is used first. In instances in which a HM is used by more than one workcenter, submarines may choose to institute procedures whereby one workcenter is responsible for ordering and storing the HM. This action also includes increasing the useful life of the material by extending the shelf life per approved procedures outlined in references D15-3 and D15-4.

h. **Used/Excess HM Disposal.** When workcenters have completely used a HM or have excess HM, they shall return the container plus any residue to the supply department for disposal. Appendix L of reference D15-5 and Maintenance Requirement Cards (MRCs), as applicable, provide guidance for determining

which types of used HM must be collected and held for treatment by shore disposal facilities. The receiving person shall annotate in the Submarine Material Control Log and process the used HM for offload per the procedures of section D1502h(4).

(1) Used HM shall be **segregated**. A container shall normally be filled with one type of HM, i.e., all the used HM in a container shall normally be of only one stock number. Used HM shall either be placed in the container for
R) the original material or in an impervious container specified in Appendix C23-A. The container shall be securely sealed using the installed or provided closure devices to ensure the container does not leak during transportation. The container shall be properly labeled (refer to paragraph D1502h(4)(a) for labeling requirements) to indicate content, and stowed in appropriate locations following the stowage precautions in this chapter for comparable HM.

(2) If the contents of an HM container are unknown, the label must state so, and the fleet must pay, from its own account, the costs of chemical analysis to determine specific content. The workcenter originating the HM for offload shall provide any information that may be useful in identifying the origin or composition of the material in the container. If the contents are unknown and the originating workcenter can determine by experience that the material is flammable or combustible, reactive, toxic, or corrosive, that information shall be supplied on the container to allow proper stowage aboard ship and at the receiving shore activity.

(3) Used lube oils shall be collected, stored, and labeled for eventual shore recycling. Synthetic lube oils and hydraulic oils shall be collected separately from other oils.

R) (4) **Procedures for Off-Loading Used or Excess HM to a Naval Shore Activity**. The Supply Officer shall be responsible for the receipt and consolidation (as appropriate) of all used/excess HM for offload. Used or excess HM shall be turned over to the shore facility HM offload activity per the requirements of reference D15-5.

(a) **Processing Used HM**

1. The workcenter generating used HM shall ensure that it is properly packaged in the original container or in a container specified for the material in appendix C23-A. If there is any question regarding the integrity of the original container (e.g., badly rusted, badly dented, or poorly sealed), the contents shall be transferred to a new container. If the material is not in its original container, the workcenter shall ensure that the material is labeled per paragraph D1502e. In addition, a label identifying the material as used HM (see appendix D15-D) shall be completed and attached to the container. This label shall contain information on the process in which the material was used (e.g., used air compressor lube oil, circuit board cleaning solvent, spent OBA canisters, etc.). It should also identify any known impurities that the material might contain based on routine analysis that may be conducted for PMS (e.g., Naval Oil Analysis Program (NOAP) test results) and any special storage requirements. This information is necessary to assist the shore activity in properly storing the used HM as well as in filling out disposal documentation if the material is processed as waste.

2. The supply department shall ensure that a DD 1348-1 (provided in SHIMS)is prepared for each container of used HM. The following in-
R) formation shall be clearly identified (where known) on the DD 1348-1: the NSN, the material name, and the manufacturer's name and address. The individual filling out the DD 1348-1 shall ensure that the container is properly labeled with information required by paragraph D1502e and with the Used Hazardous Material label specified above.

(b) **Transferring Used HM Ashore**

1. The submarine's supply officer/HM coordinator shall contact the shore activity point of contact to request a pick-up. For used HM which can be identified by a stock number and manufacturer and for which a MSDS is available in SHIMS, the submarine need not provide an MSDS to the receiving activity (one will probably be required if transferring to a non-Navy activity or overseas). Used HM for which a MSDS does not exist in SHIMS or which has been open-purchased shall be accompanied by a hard copy of the MSDS. In situations where compatible materials are inadvertently mixed, the used HM shall be accompanied by the MSDSs of each material in the mixture. If the contents are unknown, the submarine need not include a MSDS, but shall supply information, such as whether the material is flammable, reactive, toxic, or corrosive, in the "Special Stowage Requirements" item of the Used HM label to allow proper stowage at the receiving shore activity. (R

2. Shore activities shall only require that ships provide used HM that is properly packaged in the original container or in a container specified for the material in appendix C23-A, properly secured, properly labeled, with a properly filled out DD 1348-1, and with a MSDS, if the material originated outside the supply system or a MSDS is unavailable in SHIMS. Material that is non-compliant shall be returned to the originating submarine. Problems experienced with material received from a submarine shall be reported to the command and, if flagrant or repeated, to the submarine's Immediate Superior In Command (ISIC). If any additional requirements (e.g., waste profile sheets) are placed on the shore activity by Federal or State laws and regulations or by the supporting Defense Reutilization and Marketing Office (DRMO), the receiving shore activity shall ensure that these requirements are met using information supplied by the submarine on the DD 1348-1 and container label. When required, analysis of unknown material shall be charged to fleet accounts. (R

(c) **Excess HM**. A workcenter shall turn in full, properly sealed containers of usable HM in excess of its needs to the supply department. Supply department personnel shall determine if this material may be used elsewhere in the submarine or if it exceeds the submarine's needs. If the material exceeds the submarine's needs, supply department personnel shall transfer it to the supporting FISC with a properly completed DD 1348-1 for each S/N of material being transferred.

D1503. GENERAL STORAGE STANDARDS

Submarines shall observe the following general standards to minimize hazards inherent in the handling and storage of HM:

a. Mark stowage locations (including lockers) to identify type of HM stored and keep the location/materials clean and dry at all times. Submarines shall post HM stowage locations with a CAUTION sign that states:

HAZARDOUS MATERIAL STORAGE AREA

Submarines should obtain these signs through the Navy supply system using National Stock Number (S/N) 9905-01-342-4851 (10" X 7") or 9905-01-342-4859 (3" X 5").

b. Provide ventilation in HM stowage areas, where appropriate.

c. Entry of tanks where HM is stowed shall be certified as safe to enter by the gas free engineer.

d. Allow only authorized personnel access to stowage locations, where appropriate.

e. When transferring material from one container to another, ensure that existing precautionary labeling is retained and that subsequent containers are marked with appropriate precautionary labeling. DD Form 2521 or DD 2522 may be used for labeling of containers into which HM is transferred. Subsequent containers should also contain proper Atmosphere Contaminant Tags.

f. Do not transfer material to a container that has previously stored a different material without first checking the materials' compatibility.

g. Stow HM only in a container which is compatible to the material (e.g., do not place corrosive materials in metal drums).

h. Stack containers in such a way that they will not crush lower containers, become imbalanced, or be difficult to access.

i. Use material on a first-in, first-out basis, considering shelf life.

j. Prohibit smoking, eating, or drinking in stowage areas. Signs shall be posted indicating these requirements.

k. Ensure that open flames or spark producing items are not permitted in stowage areas.

l. When not in use, seal and protect all containers against physical damage and secure for heavy seas.

D1504. GENERAL HANDLING AND USE STANDARDS

For specific handling and use standards, refer to the material/item MSDS. Observe the following general standards when handling HM:

R) a. Workcenter supervisors shall ensure that, prior to using any HM, machining or abrasive cleaning of components containing HM (i.e., beryllium and other heavy metals), personnel under their supervision are trained on the hazards associated with that material and that they have been provided with necessary protective clothing and equipment (i.e., eye protection, respiratory devices, and gloves impermeable to the HM in use).

R) b. Workcenter supervisors shall ensure that spaces are well-ventilated in areas where HM is used or machined.

c. Upon completion of HM use, return surplus material to its appropriate storage location.

R) d. Avoid breathing vapors or dust when using or machining HM.

R) e. Avoid contact with the eyes or prolonged contact with skin when using or machining HM.

f. Prohibit smoking, drinking, or eating in areas where open containers of HM is being used.

g. Ensure personal protective equipment (eye protection, respiratory devices, gloves impermeable to the HM in use, etc.) is in good operating condition and is readily available to all personnel working with HM.

h. Use a respirator with appropriate filter when potentially exposed to particulate matter, hazardous gases, or vapors. Consult the MDR for specific guidance in this regard, and for a determination of the need for more stringent respiratory protection requirements.

i. Do not add incompatible materials to the same collection container.

D1505. FLAMMABLE AND COMBUSTIBLE MATERIAL

A flammable material is any solid, liquid, vapor, or gas that will ignite easily and burn rapidly with a flash point less than 1500°F. The National Fire Protection Association (NFPA) defines a flammable liquid as a liquid with a flash point below 100°F. Liquids having a flash point at or above 100°F are combustible liquids. All flammable and combustible liquids present some danger to personnel and the ship, of prime concern are those liquids having flash points below 200°F. Never carry flammable or combustible liquids aboard the submarine in quantities in excess of that required. Stow flammable and combustible liquids in approved locations. Dispense flammable and combustible liquids from shipping containers only into safety cans or other approved portable containers. Never use flammable or combustible liquids near a heat source or spark-producing device.

a. **Storage Standards**

(1) Store flammable and combustible materials following precautions listed in paragraph D1503.

(2) Store flammable and combustible materials separately from oxidizing materials (i.e., sodium nitrate, calcium hypochlorite, potassium permanganate, peroxides, and strong inorganic acids (nitric, hydrochloric, and sulfuric acids)), (see appendix D15-E: Hazardous Material Compatibility Storage Diagram).

(3) Store a maximum quantity of 12 gallons of any one type of material with a flash point greater than 200°F, but less than 1500°F (excluding grease), in an area designated by the Engineering Officer. The containers shall not be stowed within 3 feet of any surface where the temperature may exceed 140°F. More than 12 gallons of grease may be stowed in one location (in original containers and greater than 3 feet from 140°F surfaces).

(4) Submarines not having flammable/combustible liquid lockers shall store all items with a flashpoint less than 200° F, solids and semi-solids which give off flammable vapors, solids which burn with extreme rapidity because of self contained oxygen, and materials which ignite spontaneously when exposed to air in a manner that minimizes fire hazards until such time as flammable/combustible liquid lockers available.

(5) Do not stow combustible materials such as rags, paper and wood in the same area as flammable materials; however, submarines may stow oily rags in these areas after placing in suitable containers.

(6) Prohibit open flames or spark-producing items in the vicinity of flammable stowage locations.

(7) Ensure containers are secured with metal banding or other approved tie-downs vice manila line.

b. **Handling and Usage Standards**

(1) Handle and use flammable materials per the precautions of paragraph D1504. Many flammable and combustible materials have additional hazardous properties, such as toxicity. See also Section D1506.

(2) Never use flammable material near a heat source or a spark-producing device. Do not smoke in an area in which flammable material is being used. Designate spaces in which flammable materials are being used as **NO SMOKING** areas.

(3) Keep scrapings and cleaning rags soaked with flammable or combustible liquids in a covered metal container until the HM is disposed of properly.

(4) Keep suitable fire extinguishing equipment and materials ready at all times for instant use.

(5) Ensure that containers of partially used flammable materials are returned to proper stowage facilities, are tightly closed, and are properly labeled.

D1506. TOXIC MATERIAL

A toxic substance has the inherent capacity to produce personal injury or death through ingestion, inhalation, or absorption through any body surface. Toxic materials are considered, and often marked by the manufacturer as being, poisonous. Avoid contact with toxic materials by using suitable protective clothing and following safe handling procedures. Submarines must, to achieve their missions, carry some toxic material, and personnel will be called upon at times to use them. Solvents, degreasers, and refrigerants are but a few of the toxic materials that may be found aboard submarine. If stowed, handled, and used in the proper manner, toxic materials present little or no danger.

a. **Storage Standards**

(1) Store all toxic material per the standards of paragraph D1503. Many toxic materials have additional hazardous properties, such as flammability or combustibility. See also section D1505.

(2) Store all toxic material in cool, dry, well ventilated locations separated from all sources of ignition, acids and acid mists/vapors, caustics, and oxidizers, (see appendix D15-E: Hazardous Material Compatibility Storage Diagram).

(3) Seal all containers and protect them against physical damage.

b. **Handling and Usage Standards**

(1) Handle and use toxic materials per the precautions listed in paragraph D1504.

(2) Use appropriate gloves and protective clothing when handling sensitizers or potential skin irritants such as epoxy and polyester resins and hardeners where skin contact is likely. Protective skin cream shall only be used to supplement, but not replace impermeable gloves for any operation where significant contact work with potentially toxic/irritant/sensitizing materials is likely.

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c. **Halocarbons (Refrigerants)**. Liquid or gaseous halocarbons have multiple applications in the Navy. They are used as refrigerants, solvents, and dielectric fluids and as line flushing, and degreasing agents. With common names of refrigerant R-11, R-12, R-22, R-113, R-114, and R-116, these products may be better known by names such as FREON , ISOTRON , FRIGEN , FLUORANE , FREON MF , FREON TF , GENSOLV D , BLACO-TRON TF , and ARKLONE P-113 .

NOTE:

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Due to changes in the Clean Air Act, the manufacture of halocarbons is being phased out; however, they may still be used in the Navy.

(1) To minimize the size of spills, procure, store, and use halocarbons in the smallest amount and container possible for an operation.

(2) The Naval Supply System stocks all normally used halocarbons, and submarines should procure them only through that system.

(3) Prohibit smoking and hot work in areas or vicinity where halocarbons are being used.

(4) Prohibit storage and consumption of food and tobacco in areas where halocarbons are being used.

(5) Some types of FREON are nearly odorless and can numb the sense of smell. They may accumulate in low places and displace oxygen unless ventilation is provided. In high concentrations they can cause death. (R

(6) Only use FREON-113 as a solvent when specified and when such use is essential. It may not be stored or carried aboard (see 1,1,1-trichloroethane below).

d. **Toxic Cleaning Solvents**. Toxic cleaning solvents such as 1,1,1-Trichloroethane shall not be carried aboard. Submarines shall not attempt solvent cleaning except alongside a pier or tender. Submarines shall not use solvent cleaning until mechanical cleaning has failed or is technically impossible (for example, FREON flushing of O_2 piping). Use only prescribed cleaning solvents with a flashpoint greater than 140^{o}F . Do not spray diesel fuel or other solvents as a cleaning agent. When cleaning solvents are used, use explosion-proof mechanical exhaust ventilation to exhaust vapors overboard to prevent reentry and recirculation. The ventilation rate (cubic feet per minute) and any other control measures will be determined by the cognizant tender industrial hygienist (Safety Officer) or the supporting shore activity's Shore Maritime Gas Free Engineer. (R

e. **Polychlorinated Biphenyls**

(1) In general, PCBs, if properly managed, do not present a major health hazard. The Environmental Protection Agency banned PCBs in most manufacturing processes in 1979. However, PCBs may be found as a fire retardant in many materials used in ship construction where stocks of PCB material purchased prior to the ban were installed. Some examples of materials used in submarine construction that may contain PCBs include: sound dampening on reduction gears; electrical cable insulation; foam hull insulation; rubber (used as banding and sheet rubber for cableways, pipe hanger liners, isolation mount, and vent gaskets); packing and grommets for electrical cable stuffing boxes; and pipe insulation and lagging.

NOTE:

PCB-containing construction materials installed in Navy submarines need not be removed just because they contain PCBs. Installed PCB-containing construction materials normally need not be labeled.

(2) Label PCB-containing electrical/electronic components (primarily capacitors) per the guidance provided in reference D15-6. Label PCB-contaminated tools and waste materials (such as dust from ventilation ducting which are known to contain PCB-impregnated felt gaskets) per appendix D15-F.

(3) With the exception of ventilation duct cleaning, work involving known or potential PCB-containing materials shall normally be accomplished in port. Obtain assistance through the nearest naval shipyard environmental program office, Navy medical treatment facility, or NAVENPVNTMEDU prior to such action.

(4) For situations not involving unprotected PCB skin contact, employ routine work and personal hygiene measures (such as washing hands and other exposed skin surfaces with soap and water when work is completed) appropriate for any occupational setting.

(a) When working with PCB-impregnated materials such as insulating felts or with articles that contain liquid PCB solutions, strictly observe good housekeeping procedures to avoid the possibility of secondary surface contamination.

(b) Personnel involved in PCB-related work activities shall not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the space in which work is being performed.

(c) Collect and dispose of PCB-containing waste, scrap, and debris; dust collected from ventilation systems known or suspected of containing PCB-impregnated felt gaskets; and PCB-contaminated clothing (consigned for disposal) in sealed impermeable containers specified in appendix C23-A and labeled with the large label described in appendix D15-F. Disposal should be per the procedures of section D1502e. Specifically notify the receiving activity that PCBs or material containing PCBs is being transferred.

(d) Do not perform hot work in the immediate area when work is performed with PCBs or PCB-containing material. Do not perform hot work, including welding, torch cutting, brazing, grinding, and sawing on ventilation systems components within 12 inches of either side of a flange containing felt gaskets.

(e) Specific work practices for the removal and handling of PCB felt, maintenance and cleaning of ventilation ducting containing PCB felt, and maintenance and handling of other shipboard PCB materials are provided in reference D15-6.

(f) Label all reusable cleaning equipment employed in cleaning systems potentially contaminated with PCBs with PCB labels described in appendix D15-F. Use the large label whenever practicable. If the large label does not fit, use the small label. Equipment to be labeled includes vacuum cleaner, vacuum hoses and working end tools, brushes, Vent Duct Cleaning System components, dust pans, scrapers, and putty knives. Label; bag, where possible; and stow this equipment in a location where it will not be accidentally used for other purposes.

(5) The baseline industrial hygiene survey shall specify personal protective equipment and medical surveillance for any potential PCB-related work.

D1507. CORROSIVE MATERIALS

Corrosive materials are chemicals, such as acids, alkalis, or other liquids or solids which, when in contact with living tissue, will cause severe damage to such tissue by chemical action. In case of leakage, corrosive material will materially damage surfaces or cause fire when in contact with organic matter or with certain chemicals.

a. Storage Standards

(1) Store all corrosive materials per the precautions listed in paragraph D1503.

(2) Store corrosive materials in their original containers.

(3) Ensure that corrosive materials are not stored in the vicinity of oxidizers or other incompatible materials, (see appendix D15-E: Hazardous Material Compatibility Storage Diagram).

(4) Ensure that acids and alkalis are stowed separate from each other.

b. **Handling and Usage Standards**

(1) Handle and use corrosive materials per the precautions listed in paragraph D1504 or as directed by Maintenance Requirement Card, NSTM, industrial hygiene survey, or manufacturer's instructions.

(2) As a minimum, wear chemical goggles, full face shield, and acid resistant gloves when handling acids or other corrosive materials. Greater protection may be required as specified by Maintenance Requirement Card, NSTM, industrial hygiene survey, or manufacturer's instructions.

(3) Never allow corrosive materials or their vapors to come in contact with the skin or eyes.

(4) Submarine nucleonic chemistry rooms and secondary analysis stations are authorized to utilize eyewash bottles in lieu of plumbed or portable eyewash stations. Even if eyewash bottles are provided personnel shall comply with paragraph 1507b2 of this instruction. (R

c. **Inorganic Acids**

(1) Stow liquid inorganic acids such as hydrochloric, sulfuric, nitric and phosphoric acids bottled in glass or plastic in such a manner that they are cushioned against shock. They should be kept in their original shipping carton or box inside suitable acid-resistant lockers, cabinets, or chests.

(2) Maintain hydrofluoric acid in acid-proof polyethylene or ceresin-lined bottles at all times and never allow them to come in contact with skin or eyes.

(3) Do not stow inorganic acids in the vicinity of flammable liquids.

d. **Organic Acids**. Do not permit liquid and solid organic acids such as glacial acetic, oxalic, carbolic, cresylic, and picric acids to come in contact with the eyes or skin. These acids are corrosive to aluminum and its alloys, to zinc, and to lead. Keep these acids, usually packaged in glass bottles, from freezing and physical damage. Stow these acids in an approved acid locker lined with acid-resistant material, separated by a partition, or by at least 3 feet from all other material. (R

e. **Alkalis**. Stow alkalis (bases), such as lithium hydroxide, sodium hydroxide, potassium hydroxide (lye), disodium phosphate, trisodium phosphate, sodium carbonate, and ammonium hydroxide (ammonia water) in designated lockers, cabinets, or chests. Keep alkalis separated from acids, oxidizers, and other incompatible materials. Ensure the stowage area is dry.

NOTE:

Many submarine cleaning agents and laundry materials contain alkalis in very strong concentrations. Specified stowage and handling precautions for these materials must be observed.

D1508. OXIDIZERS

An oxidizer is a material such as chlorate, perchlorate, permanganate, peroxide, or nitrate which yields oxygen readily to support the combustion of organic matter, or which may produce heat or react explosively when it comes in contact with many other materials. Higher temperatures increase the possibility of oxygen release from oxidizers and the possible initiation of fire. Heat shall be avoided when handling and storing oxidizers. Oxygen candles are oxidizers.

a. **Storage Standards**

(1) Store oxidizers following precautions listed in paragraph D1503.

(2) Do not store oxidizers in an area adjacent to a torpedo room or small arms ammunition storage or heat source or where the maximum temperature exceeds 100°F under normal operating conditions.

(3) Ensure that oxidizers are not stored in the same compartment with easily oxidizable material such as fuels, oils, grease, paints, or cellulose products. Do not remove or obliterate labels.

b. **Handling and Usage Standards**

(1) Handle and use oxidizers per precautions listed in paragraph D1504.

(2) When transferring oxidizers to second containers, **ensure that the second container is compatible with oxidizing material**. Place appropriate hazardous material labels on the second container.

(3) Do not remove or obliterate warning labels from containers.

(4) Ensure oxidizing materials are only handled or used by authorized personnel.

c. **Calcium hypochlorite** is a chemical substance used to provide the sanitizing and bleaching property of chlorine without requiring the handling of liquid or gaseous chlorine.

(1) The following standards apply to the stowage of calcium hypochlorite:

(a) The ready usage stock of 6-ounce bottles issued to the Medical and Engineering Departments shall be stowed in a Medical Instrument and Supply Set Case, S/N 6545-00-131-6992, which shall be kept in a secured locker with ventilation holes, preferably located in the cognizant department office space. Under no circumstances shall the stock of calcium hypochlorite bottles be stowed in a machinery or nuclear space, berthing space, storeroom, or in the nucleonics laboratory areas.

(b) Label all lockers, bins, and enclosures with red letters on a white background:

HAZARDOUS MATERIAL, CALCIUM HYPOCHLORITE

(c) Dispose of containers as used/excess HM and replace when they exceed 2 years from the date of manufacture.

(2) The following precautions apply when using calcium hypochlorite:

(a) Mix only with water.

(b) Do not allow to come into contact with paints, oils, greases, wetting agents, detergents, acids, antifreeze, alkalis, or organic and combustible materials.

(c) Do not remove or obliterate warning labels.

(d) Dispense only in clean, dry utensils and only in amounts required for immediate use.

(e) Avoid contact with skin and eyes.

(f) Ensure containers are not used for any other purpose.

(g) For external contact or if taken internally, follow the instructions printed on the container label or on the material safety data sheet (MSDS).

(h) No special firefighting precautions are required for fires caused by calcium hypochlorite.

D1509. AEROSOLS

Aerosol spray cans are prohibited aboard submarines except as specifically allowed by the SMCL.

D1510. COMPRESSED GASES

Submarines carry numerous cylinders of compressed gases. Compressed gases are used for welding operations (oxygen and acetylene), in refrigeration and air conditioning systems (FREON), and for purging various systems (nitrogen). Cylinders of compressed gases are potential explosion, fire, and health hazards if strict compliance with applicable requirements is not followed.

a. **Storage Requirements**

(1) General

(a) Only stow compressed gases in compartments and locations designated for cylinder storage, as shown in applicable plans for each submarine. Whenever practical, stowage shall permit removal of any cylinder without disturbing other cylinders. Such locations shall:

1. Be kept free of flammable materials (especially greases and oils).

2. Be maintained at temperatures below 130^{o} F. (R

(b) Ensure that cylinder valve protection caps are in place.

(c) Stow cylinders by date of receipt, and place into service in the order of receipt.

(d) Tag empty cylinders **EMPTY**, mark **MT**, and segregate from full or partially full cylinders.

(2) Ready Service

(a) The following gas cylinders are found aboard submarines:

1. Fire extinguishers (portable).

2. Fire-extinguishing cylinders permanently connected to fixed fire-extinguishing systems.

3. Gas and chemical canisters for oxygen breathing apparatus.

4. Welding cylinders.

5. Medical gas cylinders.

6. Cylinders containing refrigerants.

7. Disposable cylinders supplied as repair kit accessories (halide leak detector kits, for example).

8. Gas cylinders for the propulsion plant operations.

9. Diving air (SCUBA) tanks.

(b) Welding Cylinders. Observe the following special instructions and precautions regarding oxygen and fuel gas cylinders in ready service:

1. Install cylinders of gas per approved plans or specifications.

2. Fasten cylinders securely in a rack. Ensure acetylene cylinders are always stowed vertically. Securely fasten the rack, in turn, at the designated locations.

3. Never leave unstowed equipment unattended.

4. Return welding units to designated stowage as soon as work is complete.

5. Attach a card to each welding unit with the following instructions:

> Return to (designated location) immediately on completion of work.
> Unit shall not be left unattended while away from above location.
> Unit is **NOT SECURE** while pressure shows on gauges, or cylinders are not firmly fastened to rack and properly stowed.

b. **Handling and Usage Requirements**

(1) Never drop cylinders nor permit them to strike against one another violently.

(2) Never use a lifting magnet or a sling (line or chain) when handling cylinders. If a crane or hoist is used, provide a safe cradle or platform to hold cylinders. Do not lift cylinders by valve protection caps.

(3) When returning empty cylinders, be sure that valves are closed and that valve outlet, if provided, and cylinder valve protection caps are in place.

(4) Ensure that all cylinders are approved under DOT regulations. Non-magnetic cylinders are an exception.

(5) Only refill cylinders when the command specifically approves such action.

(6) Fill a cylinder only with the gas for which the cylinder has been specifically designated.

(7) Do not remove or change the numbers or marks stamped into cylinders without the specific approval of the Defense General Supply Center.

(8) Never use cylinders for rollers, supports, or for any purpose other than to carry gas.

(9) Never tamper with the safety devices on valves or cylinders.

(10) Never hammer or strike the valve wheel in attempting to open or close valves. Use only wrenches or tools provided and approved for this pur-

pose. If valve cannot be turned using hand or proper tool, return the cylinder to supply activity.

(11) Be sure that the threads of regulators or other auxiliary equipment are the same as those on cylinder valve outlets. Never force connections that do not fit.

(12) Do not use regulators, pressure gauges, manifolds, and related equipment that are provided for a particular gas on cylinders containing different gases.

(13) Only repair or alter cylinders or valves when authorized by NAVSEASYSCOM. If trouble is experienced, remove cylinder from service, tag as defective, and return to supply activity. Do not remove the stem from a diaphragm-type cylinder valve.

(14) Never subject compressed gas cylinders, either in stowage or in service, to a temperature in excess of 130^{o}F. Never permit a direct flame to come in contact with any part of a compressed gas cylinder.

(15) Handle cylinders carefully. Rough handling, knocks, or falls are liable to damage the cylinder, valve, or safety devices and may cause leakage. Protect cylinders from objects that will cut or otherwise abrade the surface of the metal.

(16) When testing for leaking gas cylinders, use soapy water or leak-detection compound conforming to MIL-L-25567.

(17) Only use a gas cylinder that is properly marked (by color of paints or with the name of the gas stenciled on cylinder and valve). Return all mis-marked cylinders to the nearest Naval Supply Depot.

(18) Work center supervisors shall ensure that supply and exhaust ventilation exists in compartments where compressed gases are stored or in use, systems are in good operating condition, and have been evaluated as adequate by an industrial hygiene survey team.

(19) To thaw out valve outlets that are clogged with ice, use warm (not boiling) water. The use of boiling water will melt the fusible plugs, if present, and vent the cylinders.

(20) Never discharge a cylinder into any device or equipment in which the gas will be entrapped and create pressure. The only exception is a cylinder equipped with a pressure regulator set to control the pressure.

(21) Never use oil-tolerant gases when oil-free gases are required. Non-interchangeable valve outlets discourage this practice.

(22) Close the cylinder valve and release the gas from the regulator before removing the regulator from a cylinder valve. (R

c. **Recharging Cylinders**

(1) Recharging of diving air (SCUBA) cylinders: The charging of divers' scuba tanks from the ship's air system shall meet the purity requirements of paragraph 5.2.1.2 of reference D15-7. Commanding Officers may omit this requirement during emergency situations.

(2) Personnel may refill small cylinders of hydrogen routinely used for nuclear propulsion plant operations per the Reactor Plant Manual.

(3) Personnel may recharge fire extinguishers and fire extinguishing system cylinders per NSTM 555.

(4) Recharge a cylinder only if less than 5 years have passed since its last hydrostatic test date. The only exceptions are 3A and 3AA cylinders having water capacities under 125 pounds, for which a 10-year hydrostatic test frequency is approved. For fire extinguisher and fire extinguishing system cylinder hydrostatic test requirements, see NSTM 555.

(5) Never attempt to mix gases in a cylinder. Unauthorized personnel should never refill a cylinder.

d. **Welding Cylinders**

(1) Place cylinders a safe distance away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them. Use fire-resistant shields.

(2) Do not place cylinders where they might become part of an electric circuit. Avoid contact with energized equipment. Keep cylinders away from piping systems that may be used for grounding electric circuits, such as for arc welding machines. Any practice, such as the tapping of an electrode against a cylinder to strike an arc, is prohibited.

(3) Unless connected to a manifold, do not use oxygen from a cylinder without first attaching an oxygen regulator to the cylinder valve. Before connecting the regulator to the cylinder valve, open the valve slightly for an instant and then close. Always stand to one side of the outlet when opening the cylinder valve.

(4) Always place the fuel-gas cylinders with valve end up. Store and ship liquefied gases with the valve end up. Prior to use, store acetylene cylinders in a vertical position for a minimum of 2 hours to stabilize the gas. If acetone flows from the cylinder, put aside the cylinder for an additional period.

(5) Do not place anything on top of an acetylene cylinder that may damage the safety device or interfere with the quick closing of the valve.

(6) Never use fuel gas from cylinders through torches or other devices equipped with shutoff valves without reducing the pressure through a regulator attached to the cylinder valve or manifold.

(7) Do not use copper tubing with acetylene gas cylinders due to the increased potential for an explosive chemical reaction.

(8) Back off on the regulation screws, and then open the cylinder valves slowly. Open the acetylene valve one-fourth to one-half turn. This will allow an adequate flow of acetylene, and the valve can be closed quickly in an emergency (never open the acetylene cylinder valve more than one and a half turns). The oxygen cylinder valve should be opened all the way to eliminate leakage around the stem.

CHAPTER D15

REFERENCES

D15-1 NAVSEA S9510-AB-ATM-010/(U), Nuclear Powered Submarine Atmosphere Control Manual (NOTAL)

D15-2 Hazardous Material Information System (HMIS)

D15-3 NAVSUP Publication 4105, List of Items Requiring Special Handling (NOTAL)

D15-4 NAVSUPINST 4410.52B, Shelf-Life Item Identification, Management, and Control (NOTAL)

D15-5 OPNAVINST 5090.1B, Environmental and Natural Resources Program Manual (NOTAL)

D15-6 NAVSEA S9593-A1-MAN-010, Shipboard Management Guide to PCBs and associated NAVSEA issued PCB Advisories (NOTAL) (R

D15-7 NAVSEA 0944-LP-001-9010, U.S. Navy Diving Manual (NOTAL) (R

CHAPTER D4

WORKING OVER THE SIDE, TOPSIDE, OR ALOFT; DRYDOCK SAFETY

D0401. DISCUSSION

a. Since many areas on the exterior of a ship are inaccessible to the crew, it becomes necessary to go "over the side" or "aloft" to reach these areas. "Over the side" shall be defined as anywhere outboard of the life-lines. "Aloft" shall be defined as either work on or within the sail.

b. The greatest hazards associated with working over the side, topside, or aloft are the potential for slipping and/or falling. Other hazards include the dropping of objects on (or by) personnel and radiation burns From transmitting antenna or radar, and asphyxiation.

c. When a ship is in drydock, many of the precautions associated with working over the side, topside, or aloft must be followed. This chapter will discuss the hazards and precautions associated with this unique evolution.

d. Additional precautions for working over the side, working topside, working aloft, and drydock safety are found in references D4-1 and D4-2.

e. As a risk control measure, consider assigning a safety observer, whose only responsibility is safety, during any deck or seamanship evolution that could injure personnel or damage equipment. This safety observer should be knowledgeable in the proper performance of the evolution. Examples of deck evolutions include: underway replenishment, operation of boat davits, rigging pilot and accommodation ladders, and handling lines. (A

D0402. GENERAL PRECAUTIONS

a. Wear a parachute type safety harness with Dyna-Brake safety lanyard, working lanyard and tending line (as required) with double-locking snap hooks. The harness shall be inspected in accordance with established PMS prior to use.

b. Attach safety lanyards to all tools, if practicable. Rig a line and raise/lower tools to the work area in a bucket.

c. When underway, the commanding officer's permission is required to work over the side, topside, or aloft.

d. An experienced senior person shall check any rigging or staging prior to use. Never rig lines over sharp edges. Inspect lines for damage, rot, and wear. Secure lanyards to solid structures.

e. The petty officer in charge shall mark off the work area and keep unnecessary personnel clear. He shall also maintain a sharp lookout for anything that would cause an increase in ship's motion. If the slightest chance of collision exists, personnel shall be moved to safety.

f. Read any safety placards posted in the area prior to commencing work. Submarines shall rig temporary safety placards during hazardous evolutions topside.

g. Cranes used to suspend personnel over the side shall be certified and man-baskets shall be approved by COMNAVSEASYSCOM as safe for manned handling. Comply with the caution plates attached to the inside and outside of the man-basket gate. Personnel suspended over the side by a crane are subject to radiation burn hazards from voltage induced in the hoist wire from transmitting antenna and precautions must be taken.

d. Shift no weights within the ship while in drydock without the permission of the docking officer.

e. Ensure the ship is adequately grounded at all times.

f. Drain all lines subject to freezing, in freezing weather. If frequent service is required, maintain a small flow through the line to prevent freezing.

g. Ensure adequate topside lighting is provided by either installed dock lights or by temporary lighting, particularly in areas where normal passage is obstructed or disrupted by service lines or work in progress.

h. Ensure that any equipment which projects through the hull is operated only with the permission of the commanding officer and then with a safety observer outside the hull.

i. Do not permit horseplay, leaning on lifelines or other negligent practices leading to falling over the side.

j. Do not throw anything over the side into the dock, including debris from cleaning or preservation.

k. When carrying fuel of any kind in drydock, do not allow fuel to drain into the dock. Should it be necessary to remove any fuel from tanks while in drydock, take precautions which will prevent any of the fuel from reaching the floor of the dock.

l. Safety nets shall be rigged extending a minimum of 6 feet on both sides under all access brows between the ship and the dock apron.

D0406. CONTRACT LIBERTY BOAT SAFETY. When boat officers are assigned to contract water taxis, they have the authority to not allow boarding when the water taxi's crew performance and navigation are unsatisfactory. Boat officers must ensure boats are securely moored to the pier or landing with a minimum of two lines prior to allowing passengers to embark or debark. When weather conditions are determined to be unsafe, the boat officer has the authority to refuse to get underway. (A

CHAPTER D4

REFERENCES

D4-1 COMSUBLANT, COMSUBPAC Instruction 5400.38, "Standard Submarine Organization and Regulations Manual (SSBN)"

D4-2 COMSUBLANT, COMSUBPAC Instruction 5400.39, "Standard Submarine Organization and Regulations Manual (SSN)"

q. Many paint removal tools are noise-hazardous equipment. If so labeled, ensure that proper hearing protective equipment is worn. See chapter B4 of this manual for additional information.

r. Terminate all internal painting with oil based paints 5 days prior to sealing the ship. Terminate painting with latex or water based paint 3 days prior to sealing the ship.

s. Perform paint mixing on the pier adjacent to the ship. Post barricades to ensure there is no smoking, open flame, or hot work in the vicinity of the paint mixing area.

t. Do not permit personnel with a history of chronic skin disease or allergies to work with paint compounds or thinners. Personnel who are sensitive to paint compounds and thinners shall report to the medical department for evaluation.

u. Do not allow food or drink in the paint area. When handling painting materials, take care to wash hands prior to eating, drinking, smoking, or using the head.

v. When painting engineering spaces, they should be in a cold-iron condition before and during paint application. Heat-producing work areas adjacent to where brush/roller application of paint is being performed may be considered, provided that:

(1) The painting operation involves only minor (touchup) operations.

(2) There is no hot work within 25 feet of painting operation while using surface ventilation lineup, unless separated by a water tight bulkhead.

w. For paint removal from special hull treatment (SHT), refer to the SHT technical manual for specific guidance and safety requirements. (R

D1203. SAFETY PRECAUTIONS FOR PAINT REMOVAL

a. Do not perform shipboard paint removal by ship's force for cosmetic reasons or due to excessive thickness. Shipboard paint removal by ship's force should only be done when required to accomplish preservation of corroded surfaces, incidental to hot work, welding, or when bare metal is necessary for an inspection.

b. Keep mechanical grinding and sanding to the absolute minimum with primary reliance on impact tools and authorized chemical paint strippers for paint removal.

c. Assume all paint contains substances, such as lead or chromate, which are hazardous to your health if ingested or inhaled in small amounts, unless proven otherwise by sample analysis. (See chapter B10 for sample analysis procedures).

d. Personal protective equipment (PPE) contained in AEL 2-330024045, asbestos rip-out kit, may be used for paint removal, provided an inventory is maintained.

e. Ensure that all personnel involved in paint removal wear disposable coveralls, gloves, and other PPE as required.

f. Follow the recommendations of the respiratory protection manager and the requirements of chapter B6 regarding the use and care of respirators.

Appendix D15-A
SUBMARINE MATERIAL CONTROL LIST (SMCL)
FEEDBACK REPORT (SFR)

ACTIVITY INFORMATION

Submarine/Hull No.: _____ UIC: _____
Ship's Point of Contact: _____ Telephone: _____
Recommended Action: Add/Delete/Other: _____

Hardcopy submission:

Forward Original SFR to:
Naval Surface Warfare Center, Carderock Division
Code 632
9500 MacArthur Boulevard
West Bethesda, MD 20817-5700

Copy To:
Commanding Officer
Naval Sea Systems Command
Code 05L23
2531 Jefferson Davis Highway
Arlington, VA 22242-5160

(R

MANUFACTURER DATA

NSN: _____ Trade Name/Nomenclature: _____
Part No.: _____ Specification No.: _____ UI: _____
Manufacturer: _____ Cage: _____
Address:_____
City: _____ State:_____ ZIP:_____
Point of Contact: _____Phone: _____

TECHNICAL DATA

System/Equipment/Material Use (including typical/average/maximum ambient and surface temperatures where material will be used.): _____
_____
_____
_____
Method of Application: _____
_____
Proposed Usage: _____
_____
Negative Impact of Not Having Material Available: _____
_____
Special Training Requirements: _____
_____
Precautions (including local/general ventilation, personal protection equipment, including respiratory protection to be used):
_____
_____
Properties (i.e. corrosivity; reactivity; toxicity, etc.): _____
_____
MSDS Attached: Yes_____ / No _____
Advantages of Using this Material over Materials used in the Past:_____
_____
Comments: _____
_____

Appendix D15-A
INSTRUCTIONS FOR SMCL FEEDBACK REPORT
ACTIVITY INFORMATION

Submarine/Hull no.: Enter submarine name and hull number.

UIC: Enter the reporting activity's Unit Identification Code.

Ship's Point of Contact: Enter name, rank and telephone number for ship's point of contact.

Recommended Action: Enter appropriate item for addition, deletion or other, such as substitution.

R) **Hardcopy Submission:** Mail original to NSWCCD Code 632 and one copy to NAVSEA.

MANUFACTURER DATA

NSN: Enter the National Stock Number for the item listed on the SFR request.

Trade Name/Nomenclature: Enter item nomenclature such as detergent, general-purpose window cleaner, etc.

Part Number: Enter the manufacturer's product number or designator.

Specification No.: Enter Military or Federal specification number (if applicable).

UI: Enter the Unit of Issue.

Manufacturer: Enter the manufacturer's name.

CAGE: Enter the Commercial and Government Entity Identifier, a 5-digit number used to identify the item's manufacturer. CAGE numbers are found in the Defense Logistic Agency (DLA) Handbook.

Address: Enter the manufacturer's complete address as shown on the product.

Point Of Contact: Enter the name and phone number of manufacturer's POC (if known**).**

TECHNICAL DATA

System/Equipment/ Material Use: Enter description of system, equipment or application where material will be used. Identify ambient and maximum temperature the material will be exposed to.

Method Of Application: Provide information on the application of the material.

Proposed Usage: Specify when (in port and/or underway) and how much material is required(quantity and frequency of use, both in port an/or underway).

Negative Impact Of Not Having Material Available: Enter negative effects of not having the item for use.

Special Training Requirements: Enter any special training needed for prospective users.

Precautions: Enter any precautions (i.e., local/general ventilation, personal protection equipment and respiratory protection to be used) that should be followed when applying, storing, or disposing this product.

Properties: Enter any properties (i.e. corrosivity, reactivity; toxicity, etc.) that the item has.

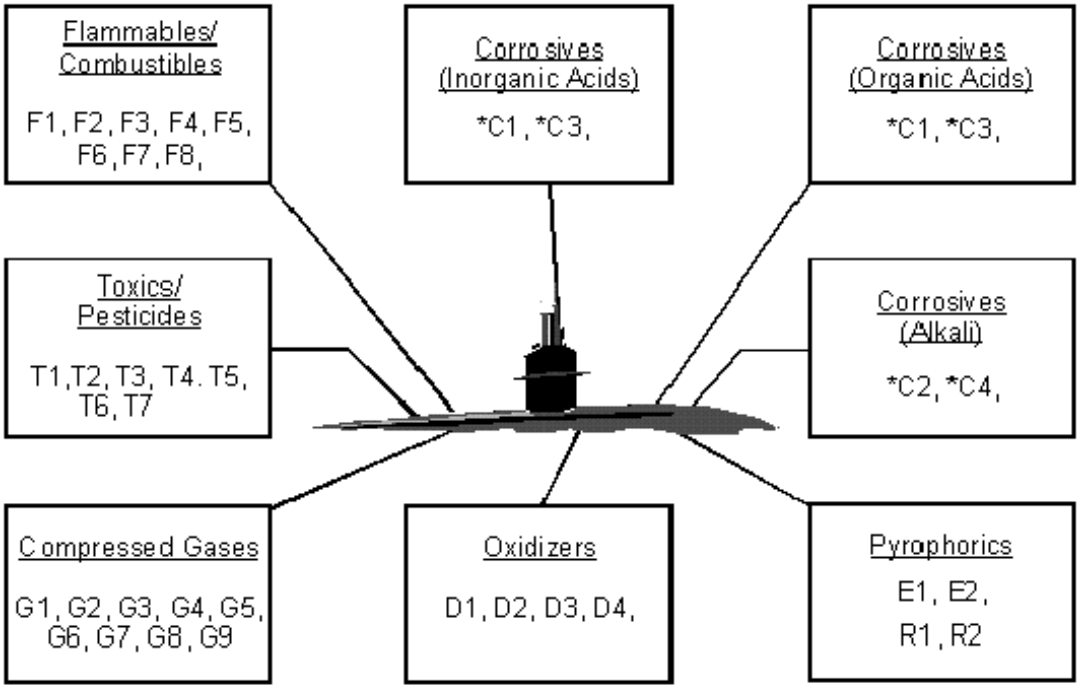
MSDS Attached: Check box as to whether or not a Material Safety Data Sheet is included in package.

Comments: Enter any comments not covered in other sections concerning item.

Appendix D15-E

HAZARDOUS MATERIAL COMPATIBILITY STORAGE DIAGRAM (USING HAZARD CHARACTERISTIC CODE (HCC))

The Hazardous Characteristic Code (HCC) for each item can be found in the MSDS located in the Submarine Hazardous Material Control List (SMCL).



(R

Instructions:

1. Each block represents a separate stowage location. The codes in the boxes are grouped with other codes with which they are compatible for storage. Generally, materials with different codes will not be stowed together unless specified below:

a. Inorganic acids may be stowed in a flammable liquid storeroom inside a designated locker, separated by at least three feet from all other material.

b. Organic acids may be stowed in a flammable liquid storeroom inside a designated locker, separated by at least three feet from all other material.

NOTES:

*C1, C3 - HM identified with the C1 or C3 code may be either an inorganic or an organic acid. See page D15-E-2 for examples of inorganic and organic acids.

GLOSSARY

The words **shall**, **will**, **must**, **should**, **may**, and **can** are used throughout this manual. **Shall**, **will**, and **must** are directive in nature and require mandatory compliance. **Should** is a strong recommendation, but compliance is not required. **May** or **can**, when used, are optional in nature and compliance is not required.

Abate - To eliminate or reduce permanently an unsafe or unhealthful working condition by coming into compliance with the applicable NAVOSH standard.

Abrasive-blasting Respirator - A continuous flow airline respirator constructed so that it will cover the wearer's head, neck, and shoulders and protect the wearer from abrasives and other related materials.

Acid - Any corrosive having a pH less than 7.

Acid Locker - A locker specifically designed and authorized for storing HM with a
pH less than 7.

Action Level - Unless otherwise specified in a NAVOSH standard, one-half the relevant Permissible Exposure Limit (PEL) or Threshold Limit Value (TLV).

Acute - Severe, usually crucial, often dangerous in which rapid changes are occurring. An acute exposure runs a comparatively short course.

Administrative Control - Any procedure which limits daily exposures to toxic chemicals or harmful physical agents by control of the work schedule.

Aerosol - Any material dispensed from a pressurized container using a gas propellant.

Afloat Mishap - Any mishap caused by DoD operations resulting in injury or death to anyone aboard the ships (craft) listed below whenever the ship is underway; ship's military and Federal civilian mariners assigned as a crew member (permanent or under temporary orders) aboard the ships listed below, on- or off-duty ashore; or material loss or damage, occurring to the ships listed below at all times, both underway and moored:

a. Commissioned, U.S. Navy ships and their embarked boats and landing craft or leased boats and floating dry-docks. (R

b. Pre-commissioned, U.S. Navy ships and their embarked boats and landing craft or leased boats beginning when the ship gets underway for Acceptance Trials (R

c. All on-duty diving mishaps.

Afloat Special Case Mishaps - For data collection and analysis purposes, the following special case mishaps are reportable to COMNAVSAFECEN in a MR:

a. All cases of electric shock. (Include the voltage in the report.)

R) b. All cases of grounding, collision and flooding.

R) c. All fires.

d. All cases of hazardous material, chemical, or toxic exposure requiring medical attention.

e. All mishaps involving explosives, oxidizers, incendiaries, explosive systems, or chemical warfare agents. They include the detonation, accidental launch, malfunction, dangerous defect, improper handling, damage to a launching device, weapon impact off-range or other unusual or unexpected weapons-related occurrence. They shall be reported using the information provided in appendix A6-F. If the explosive mishap meets the criteria for an afloat Class A mishap, a mishap investigation board shall conduct a formal mishap investigation and submit an MIR.

R) f. All diving cases involving central nervous system (CNS) oxygen toxicity, pulmonary over-inflation syndrome (POIS) or hyperbaric treatment.

g. All cases of back injury requiring medical attention.

ALARA - As Low as Reasonably Achievable.

R) **Alternate Standards** - Proposed standards giving equal or better protection than existing NAVOSH standards. Proposed alternate standards shall be submitted to CNO (N45) through the chain of command for approval.

ANSI - American National Standards Institute, a national consensus standard-developing organization.

Atmosphere Immediately Dangerous to Life or Health (IDLH) - The concentration of a contaminant which can produce an immediate irreversible debilitating effect on health, or which can cause death.

Asbestos - A fibrous mineral, which can be produced into a material that is fireproof and possesses high tensile strength, good heat and electrical insulating capabilities, and moderate to good chemical resistance.

Asbestos Medical Surveillance Program (AMSP) - A program consisting of a periodic medical screening examination which may include special purpose histories, physical examinations and laboratory tests. Directed at detecting early changes in specific organ systems which have been identified with asbestos diseases.

Audiogram - A graph or table showing hearing threshold levels as a function of frequency.

Audiometer - Instrument used to measure hearing sensitivity using pure tones.

Aviation Bends (Altitude Decompression Sickness) - Aviators exposed to altitude may experience symptoms of decompression sickness similar to those experienced by divers.

A-Weighted Sound Level - Sound level in decibels as measured on a sound level meter using an A-weighted network. This network attempts to reflect the human ear's decreased sensitivity to low frequency sounds.

Authorizing Officer - Officer in the tag-out program who has authority to sign tags/labels to be issued or cleared.

Base - Any corrosive having a pH greater than 7.

Baseline Survey - Initial survey (after construction or overhaul) to identify hazardous workplace conditions or unsafe work practices.

Biological Monitoring - Periodic examination of blood, urine or any other body substance to determine exposure to toxic substances.

Bound Asbestos - Asbestos which is tightly compacted and is not normally a health hazard unless worked by punching, grinding, machining or sanding or when the material is deteriorated.

Canister, Oxygen-Generating - A container filled with a chemical which generates oxygen by chemical reaction.

Capture Velocity - That velocity at a distance from a hood, necessary to overcome dispersive forces and capture the contaminant.

Carbon Dioxide Fixed Flooding Systems - Fire extinguishing systems that may be used to protect spaces such as paint lockers, generator rooms, pump rooms, engine rooms, and flammable liquids storerooms.

Cartridge, Air-Purifying - A container with a filter, sorbent, or catalyst, or any combination of these which removes specific contaminants from the air drawn through it.

Caustic - Any corrosive having a pH greater than 7.

Caution Tag - Yellow tag used as precautionary notification to indicate that caution must be exercised in operating tagged equipment.

Chemical Agent - A chemical compound intended for use in military operations to kill, seriously injure, or incapacitate people through its chemical properties. Excluded are riot control agents, chemical herbicides, pesticides, and industrial chemicals unrelated to chemical warfare.

Chronic - Persistent, prolonged, repeated.

Class A Mishap (afloat) - The total cost of reportable damage is $1,000,000 or more; or any injury or work-related illness resulting in death or permanent total disability. All Class A mishaps occurring on a ship specified in paragraph A0601 require investigation by a mishap investigation board (MIB) and submission of a Mishap Investigation Report (MIR). Class A mishaps occurring ashore or as a result of motor vehicle mishaps shall be reported by mishap report (MR), motor vehicle mishap report (MV), or a off-duty recreation, athletic and home mishap report, and do not require a mishap investigation board. (R

Class B Mishap (afloat) - The total cost of reportable property damage is $200,000 or more, but less than $1,000,000; an injury or work-related illness resulting in permanent partial disability; or a mishap resulting in the hospitalization of three or more people. (R

a. Type commanders shall direct the investigation of shipboard Class B or other mishaps or near mishaps by a mishap investigation board if the investigation may reveal vital safety information.

b. Class B mishaps not investigated by a mishap investigation board shall be investigated and reported using a MR, DV, MV, or RAHS.

Class C Mishap (afloat) - The total cost of reportable property damage is $20,000 or more, but less than $200,000; or an injury preventing an individual from performing regularly scheduled duty or work beyond the day or shift on which it occurred; or a nonfatal illness or disability causing loss of time from work or disability at any time (lost time case). For data collection and (R

analysis purposes, Class C mishaps shall be reported to COMNAVSAFECEN by MR, DV, MV, or RAHS if:

R) a. The total cost of reportable property damage is $20,000 or more, but less than $200,000.

b. There is an injury preventing an individual from performing **regularly scheduled duty or work** 5 days beyond the day or shift on which it occurred.

Collection, Holding and Transfer (CHT) System - A type of marine sanitation device installed aboard naval ships. This system employs waste holding tanks for use when transiting restricted zones. It is only installed on ships of sufficient size to accommodate the tanks without reducing military capabilities.

Combustible Liquid - A liquid having a flash point at or above 100^{o}F.

Compressed Gas - Material, which may or may not be HM in itself, which is stored in pressurized containers.

Concentration - The quantity of a substance per unit volume (in appropriate units).

Examples of concentration units are provided below:

- mg/m^3 milligrams per cubic meter for vapors, gases, fumes or dusts
- ppm parts per million for vapors or gases
- fibers/cc fibers per cubic centimeter for asbestos

Confined Space - A compartment such as a double-bottom tank, cofferdam or void, which because of its small size, limited access, or confined nature can readily create, aggravate, or result in a hazardous condition due to the presence of toxic gases or lack of oxygen.

Contaminant - A material that is not normally present in the atmosphere, which can be harmful, irritating or a nuisance to anyone who breathes it.

Contractor Caused Mishaps - Injuries or work-related illnesses of DoD personnel caused by contractor operations. The parent command of affected DoD personnel shall report these mishaps. Mishaps involving civilian contractor personnel caused by contractor operations shall be referred to COMNAVSAFECEN for guidance.

Conventional Ordnance Deficiency - A malfunction, observed defect, or induced defect involving conventional ordnance, explosives, ammunition, explosives systems or devices, support and handling equipment used to handle, load, store, or transport ordnance.

Corrosive Material - Any HM that will cause severe tissue damage by chemical action or materially damage surfaces or cause a fire when in contact with organic material or certain other chemicals.

Current Ships Maintenance Project (CSMP) - A computerized report which lists the deferred maintenance reported by a command. Such reports are also provided to the type commander. Reports can provide either a detailed or summary listing of deferred maintenance information. The CSMP is used for generating

Effectiveness of Corrective Action - The degree to which the proposed hazard abatement system can be expected to reduce the cited hazard. For health hazards, this would typically be expressed as the intensity of the hazardous chemical or physical agent remaining, in appropriate units, after the proposed abatement measure is operational. For safety hazards, effectiveness is expressed as "in full compliance" or "not in full compliance" with the applicable standard, if any.

Electric Shock - The passage of direct or alternating electrical current through the body or a body part.

Electrical Safety Officer - Person who is responsible to the commanding officer in conducting an effective ship-wide electrical safety program.

Emergency Repair - A repair necessary to protect life or the ship.

Employment Mishap - A mishap occurring as a result of work performance exposure to the work environment.

R) **Enlisted Safety Committee** - A committee consisting of the safety officer, division safety petty officers, and the chief master-at-arms. Identifies and discusses NAVOSH problems, enhances interdepartmental communication in mishap prevention, and submits issues and recommendations to the Safety Council.

Explosion - The unintentional or inadvertent initiation, detonation, deflagration, reaction, or burning of ordnance material resulting in damage, death, or injury.

Explosive Material - A chemical, or a mixture of chemicals, which undergoes a rapid chemical change (with or without an outside supply of oxygen) liberating large quantities of energy in the form of blast, light, or hot gases. Incendiary materials and certain fuels and oxidizers which can be made to undergo a similar chemical change are also explosive materials. Examples of explosive materials include:

a. Explosives. TNT, PBXN, PETN, PBXC, RDX, compositions, Explosive D, tetryl, fulminate of mercury, black powder, smokeless powder, flashless powder, and rocket and missile propellants.

b. Fuels and Oxidizers. OTTO fuel, mixed amine fuel, inhibited red fuming nitric acid, and ethylene oxide.

c. Incendiaries. Napalm, magnesium, thermite, and pyrotechnics.

Explosive Mishaps - An incident or accident involving conventional ordnance, ammunition, explosives, or explosive systems and devices resulting in an unintentional detonation, firing, deflagration, burning, launching of ordnance material (including all ordnance impacting off-range), leaking or spilled propellant fuels and oxidizers, or chemical agent release. Even if an ordnance system works as designed, if human error contributed to an incident or accident resulting in damage, injury, or death, the event is reported as an explosive mishap. Explosive mishaps include:

a. An unintentional or inadvertent initiation, explosion, or reaction of an explosive material, component, or system. Accidental discharge of all guns, including small arms.

b. An unintentional launching of a weapon.

R) **Incompatible HM/HW** - Materials that react with each other to produce undesirable products. Mixing incompatible hazardous material can6 produce heat, pressure, fire, explosion, toxic or irritating effects, or flammable dusts, mists, fumes, or gases.

Industrial Hygiene - The science that deals with the recognition, evaluation and control of potential health hazards in the work environment.

Industrial Hygiene Officer (IHO) - Medical Service Corps officer with a subspecialty and trained in the area of industrial hygiene. Trained to identify, evaluate, and prescribe controls for workplace hazards. Assigned as safety officer aboard tenders and as assistant safety officer aboard aircraft carriers. Some staffs are designated to have IHOs assigned.

Injury - Traumatic bodily damage, such as a cut, fracture, burn or poisoning, caused by a single or acute (short-term) exposure to an external force, toxic substance, or physical agent.

Inspection - Careful and critical workplace monitoring for safety hazards and deficiencies conducted by ship's force and outside commands (type commander, group commander, squadron commander, Inspection and Survey (INSURV) Board). Ensures that standards are being observed.

Interim Controls - Those measures meeting or exceeding minimum requirements for temporary protection of personnel or operations pending full and complete corrective action.

In-Use Material (IUM) - The minimum quantity of HM required to be ready for a 1-week's use by Maintenance Requirement Cards (MRCs) Job Process, etc.

Ionizing Radiation - Radiation with sufficient energy to strip electrons from atoms in the media through which it passes. Examples include alpha particles, beta particles, X- and gamma-rays.

Isolation - The physical separation of a hazard from potential personnel contact by the use of a barrier or limiter.

Laser - A device which generates coherent electromagnetic radiation in the ultraviolet, visible, or infrared regions of the spectrum.

LCAC Mishap Categories - Mishaps involving LCACs including:

a. Operational Mishap (OM) - Mishaps in which the intent for operation of the craft existed at the time of occurrence. Intent for operation exists when an LCAC engine is started to commence authorized operations. An engine is started the instant an attempt is made to set it in motion from within or outside the craft. The intent for operation continues until the LCAC comes to rest at the intended landing site with the engines and propellers stopped.

b. Non-operational Mishap (NOM) - Mishaps in which there was no intent for operation of the craft at the time of occurrence.

D)

Lost Workday Case - A reportable lost-work-time case in a Class C mishap is one preventing a person from performing duty or work for 5 days or more after 2359 on the day of injury or onset of illness. This includes assignment to the Binnacle List or sick in quarters (SIQ). It does not include in port weekends, regular leave, or holidays, when not scheduled for duty. However, if the person is in a light-duty status or performs some work (even though not his or her normal job) it is not lost-work-time. All lost time while underway is considered lost-work-time.

Man-made Vitreous Fibers (MMVF) - are a group of fibrous inorganic materials, generally aluminum or calcium silicates, that are derived from rock, clay, slag, and glass and used for thermal and acoustical insulation and as reinforcement materials.

Material Safety Data Sheet (MSDS) - Written or printed data concerning a HM prepared by the manufacturer of the HM in accordance with paragraph (g) of 29 CFR 1910.1200 - Hazard Communication.

Medical Attention - An injury or exposure requiring treatment by the ship's medical department representative (physician, nurse, or corpsman) and a medical record entry.

Medical Surveillance - An effort to monitor the health of individuals for job certification/recertification, for ensuring the effectiveness of hazard limiting programs, for indication of excessive exposure in the workplace and for compliance with NAVOSH standards.

Medical Treatment - Treatment administered by a physician or by registered personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even though provided by a physician or registered professional personnel.

Mercury Control Officer - Appointed in writing by the commanding officers of afloat IMAs to ensure the requirements of this directive, if applicable, are implemented. (R

Military Personnel - All Navy military personnel on active duty (USN/USNR); Naval Reserve personnel (USNR-R) on active duty or in a drill status; Naval Academy midshipmen; Reserve Officer Training Corps (ROTC) midshipmen when engaged in directed training activities; and other DoD and Foreign National military personnel assigned to the Navy or embarked in Navy or Military Sealift Command ships.

Mishap - Any unplanned or unexpected event causing personnel injury, occupational illness, death, or material loss or damage or an explosion of any kind whether damage occurs or not.

R) **Mishap Causes** - Conditions or events explaining why a mishap occurred. Refer to Chapter A6, Appendix A6-E, pages 4 through 6 for examples of mishap causes.

Mishap Costs - Include all DoD property damage, other property damage, and injury costs.

a. DOD Property Damage Costs. The cost of repair or replacement of all DOD property involved in the mishap by determining the actual cost of materials or
R) by estimates provided by the repair activity. If necessary, use estimates based on the actual cost of materials and $18 for each hour of organizational- or intermediate-level labor or $60 for each hour of depot-level labor.

b. Other Property Damage Costs. The actual cost of repair or replacement, if possible.

c. Injury Costs. The cost based on the extent of injury reported and current costs estimates. Calculated by COMNAVSAFECEN.

d. Written Estimates. When prepared in written form, all estimates must conspicuously state:

"This estimate is prepared solely for the purposes of OPNAVINST 5100.19D. It is not intended to reflect, in any way, the extent of any party's damages or liability for purposes of administrative claims or litigation."

e. Assistance With Damage Issues. In all matters related, in any way, to damage to civilian or foreign ships on navigable water, to damage to any property or cargo on board such ships, or to injuries of persons on board such ships, refer to chapter XII of the NAVJAGMAN and/or contact the Office of the Judge Advocate General, Admiralty Division (Code 31).

Mishap Investigation - The investigation conducted into the facts surrounding the causes of a mishap.

Mishap Investigation Board (MIB) - A formal investigating body appointed to determine the primary cause(s) of Class A shipboard mishaps. The board consists of a minimum of three members. The immediate superior in command (ISIC) of the ship or craft involved in the mishap normally appoints the senior member of the mishap investigation board.

Mishap Investigation Report (MIR) - A report written by a mishap investigation board as a result of Class A and selected Class B and other mishaps or near mishaps. An MIR contains privileged information. See appendix A6-A for information on the concept of privilege and appendix A6-C for the MIR format.

Mishap Probability - The likelihood that a deficiency will result in a mishap, based on an assessment of such factors as location, exposure in terms of cycles or hours of operation, and affected population. Represented by a letter according to the following criteria:

Subcategory	Description
A	Likely to occur immediately or in a short period of time.
B	Probably will occur in time.

C May occur in time.

D Unlikely to occur.

Mishap Report (MR) - A report containing privileged information. Surface ships, LCACs, floating dry-docks, and submarines submit a MR for all reportable shipboard mishaps not investigated by a MIB. See Appendix A6-I for MR format. (R)

Mist and Fog - Finely divided liquid droplets suspended in air and generated by condensation or atomization. A fog is a mist of sufficient concentration to obscure vision. Examples of materials and processes that produce mists: acid sprays used in metal treatment (e.g., electroplating) organic solvent sprays, and spray painting).

Monitoring Industrial Hygiene - Measurement of the amount of contaminant or physical stress reaching the worker in the environment.

Monitoring (Medical Surveillance) - The preplacement and periodic evaluation of body functions to ascertain the health status of personnel exposed to significant concentrations of toxic substances (e.g., decreased lung function, dermatitis, abnormal blood count) allowing early detection of adverse health effects on the individual.

Monitoring Hearing Tests - Periodic hearing tests, obtained subsequent to the reference hearing test, which are used to detect shifts in the individual's threshold of hearing.

Moored - Secured alongside a pier, wharf, quay, or causeway; to a mooring buoy; or at anchor.

Motor Vehicle Mishap - A mishap entailing the operation of a motor vehicle or motorcycle involving collisions with other vehicles, objects, or pedestrians; fatality, personal injury, or property damage; fatality or personal injury in moving vehicles or by falling from moving vehicles; towing or pushing mishaps; and other injury and property damage. Collisions involving pedestrians or bicyclists when struck by a motor vehicle or other vehicular objects are to be included if other reporting requirements are met.

MSHA - Mine Safety and Health Administration.

NAVOSH - Navy Occupational Safety and Health.

Navy Environmental and Preventive Medicine Unit (NAVENPVNTMEDU) - A Navy Medical Command activity which provides training and technical assistance in environmental and occupational health to Navy commands, afloat and ashore.

Navy Occupational Safety and Health (NAVOSH) Standards - Occupational safety and health standards published by the Navy which include, are in addition to, or are alternatives for, the OSHA standards which prescribe conditions and methods necessary to provide a safe and healthful working environment. Afloat standards are given in section C of this manual and submarine standards are given in section D of this manual.

Navy Personnel - Includes the following categories:

a. **Civilian** - General Schedule and Wage Grade employees; Youth/Student Assistance Program employees, Foreign Nationals directly employed by Navy commands; and non-appropriated fund employees.

b. **Military** - All U.S. Navy personnel on active duty; U.S. Military Reserve or National Guard personnel on active duty or in drill status; Service Academy midshipmen/cadets; Reserve Officer Training Corps midshipmen when engaged in directed training activities; Foreign National military personnel assigned to Navy commands. Personnel of other branches of the Armed Forces serving with the Navy.

(A **Near Mishap** - An act or event in which injury or damage was avoided merely by chance.

NIOSH - National Institute of Occupational Safety and Health.

NIOSH/MSHA Certified Equipment - Respirators or other equipment that have been tested by NIOSH or MSHA and jointly approved as meeting certain minimum requirements of protection against specified hazards.

Noise Exposure - Personal interaction to a combination of effective sound level and its duration.

Non-ionizing Radiation - Radiation which is not capable of stripping electrons from atoms in the media through which it passes. Examples include radiowaves, microwaves, visible light, and ultraviolet radiation.

Normal Working Population Exposed to Hazard - The number of people whose authorized activities cause them to be exposed to the specified hazardous condition on a significant number of occasions during a work year; no one should be included in this estimate who is exposed to the cited hazard so infrequently or at such low exposure concentrations that it can be considered insignificant. Do not count as exposed those persons who only occasionally pass by the door of a room where a hazard is present.

For specific chemical or physical agents, the population exposed is dependent on the numbers of personnel involved in the specific activity, the effectiveness of confinement or containment systems, and the process steps involved. For agents requiring extensive processing, potential exposure may be ship-wide, but will vary in intensity. If isolation is practiced, the exposed population may be only one person per shift or watch. If collection systems are not used to confine potential emissions, personnel not actively engaged in the operation may also be exposed to hazardous substances.

Populations exposed to a specific safety hazard will vary with the type of hazard and its locations. If the safety hazard is associated with a specific piece of equipment, only the operator may be exposed. For a grinder, the population exposed could differ according to the safety features of the equipment. If the grinder has a guard, only the operator might be injured through contact with the grinding wheel; on the other hand, if a grinder is without an adequate guard, shattering of the grinding wheel could injure other personnel in the immediate vicinity.

Occupational Health - That multidisciplinary field of general preventative medicine which is concerned with the prevention and/or treatment of illness

tors, electrical matting, barricades, traffic cones, lights, safety lines, and life jackets.

Pesticide - Any chemical used to kill pests, such as insects.

Examples: Baygon (propoxur), Killmaster (dursban), d-phenothrin, Malathion.

pH – A number specifying the acidity or alkalinity of a solution.

Physiological Heat Exposure Limit (PHEL) - A set of curves that compare the Wet Bulb Globe Temperature (WBGT) index and the degree of effort or work rate to determine the maximum permissible exposure to the heat stress environment.

Potentially Hazardous Noise - Exposure to 85 dB (A-weighted) or greater sound level or 140 dB peak sound pressure level for impact or impulse noise. The safe exposure time (T) for periods of less than 16 hours in any 24-hour period may be determined using the equation:

$$T = \frac{16}{2^{\frac{L-80}{4}}}$$

where T = Time in hours and L = Effective sound level in dBA.

Potentially Hazardous Noise Area -

a. Any work area where the A-weighted sound level (continuous or intermittent) is routinely 85 dB or greater.

b. Any work area where the peak sound pressure level (impulse or impact noise) routinely exceeds 140 dB.

Private Motor Vehicle - A motor vehicle (not government owned), primarily designed for highway use to transport cargo or personnel. Under this definition, a moped is a motor vehicle. Although not designed primarily for highway use operation, ATVs and trail bikes are included in this definition. Any object such as a trailer being towed by a motor vehicle is a part of the vehicle, including such devices when detached while in motion or set in motion by a motor vehicle (for example, pushing).

Privileged Information - That information voluntarily provided under a promise of confidentiality, or information which would not have been discovered but for information voluntarily provided under a promise of confidentiality. The deliberative analyses of findings, conclusions, and recommendations of the mishap investigation board (MIB) in the MIR are privileged. Also privileged are calculations and deductions the MIB make that would reveal the board’s deliberative process. Mishap investigation report endorsements (MIREs) are also part of the deliberative process and are similarly privileged against disclosure. Appendix A6-A thoroughly discusses privileged information. R)

Property Damage - DoD and civilian or foreign facilities, equipment, property, or material destroyed or made inoperable in a DoD mishap. DoD expresses property damage severity in terms of cost. Total costs determine whether a mishap is reportable.